TACOM

ARDEC

SHOULDER-FIRED WEAPONS ENHANCEMENTS

20 June 2001

Close Combat Armaments Center

David Burkhardt - TACOM-ARDEC
Mark Picchianti - TACOM-ARDEC

Purpose

The Army has several types of disposable and reusable shoulder-fired weapon systems in inventory to defeat a variety of threat targets. The next generation of these types of weapon systems is based on leveraging emerging technologies; including advanced warheads, propulsion and fuzing systems, that will meet the soldiers requirements in the Interim and Objective Forces in the decades to come.

SMAW-D - Bunker Defeat Munition

Full Materiel Release and in Production for U. S. Army Contingency Forces

E & T Bunker

8” Concrete Wall

Triple Brick Wall

Russian BMP-2

Cinder Block Wall

Filled Block Wall

Russian BTR-60

Disposable Launcher

HEDP Ammunition

Neutralizes Earth and Timber Bunkers
Defeats Light Armor
Breaches Masonry Walls

Caliber..... 83 mm
Length..... 32 in.
Weight..... 16 lbs.
Range…….. 15-500 m
Use……Day or Hight

8" MONTAGE WALL

LAV-F.mpg

Multi-Role Anti-Armor, Anti-Personnel Weapon System (MAAWS)

- Fielded To USSOCOM (Rangers and SEALs)
- Reusable 84mm, 22 Pound, 42 Inch Launcher
- Full Family Of Ammunition
  - HEAT, HEDP, HE, ADM, Smoke, Illumination
  - Weight 5.7-7.9 lbs
  - Full And Subcal Training Systems
- Maximum Effective Range: 100-1000m
- Ranging System With Picatinny Rail
- Currently In Production
- Used In Over 40 Countries

Saab Bofors Dynamics AB, Karlskoga, Sweden

MAAWS Program Strategy

Readiness
MAAWS Fielding and Sustainment

- Procurement To Support Current Users
- Procure/Field To New Users
- Weapon Life Study and Improvements
- Spare Parts Resupply System

Upgrades
PIP Efforts

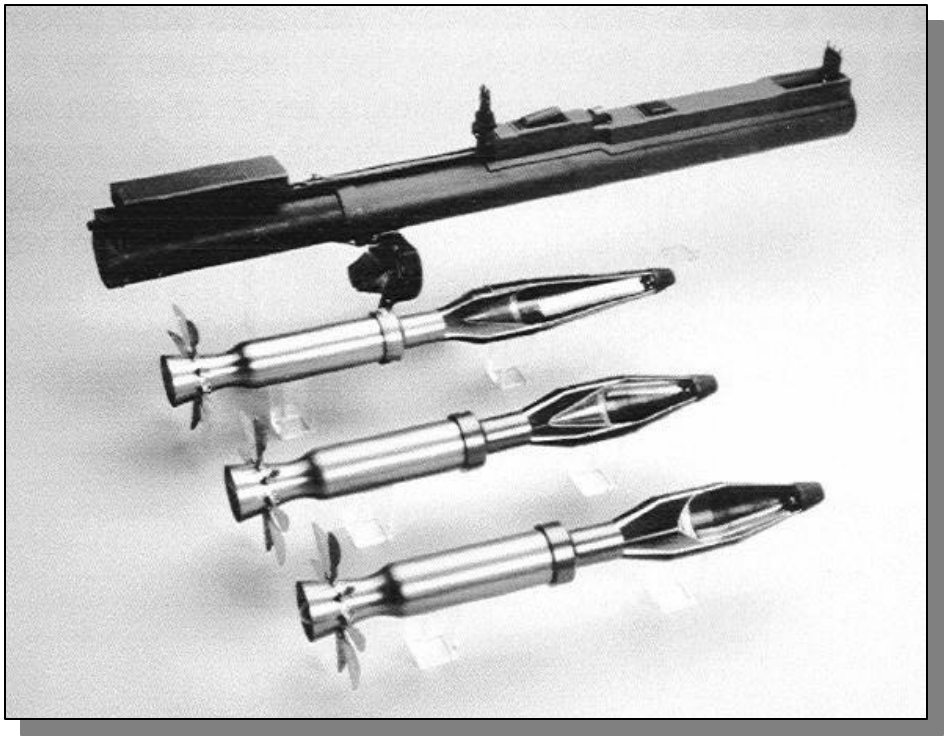
- Foreign Comparative Test Programs
  - -Upgraded HEAT, HE Fuzes
  - - Low Cost Training Rounds
  - - IM HEDP & HE Rounds
  - - ADM Round
- Day/Night Laser Rangefinder Sight
- Smoke, IR Illum Rounds with Upgraded Fuzes

Future
Increase Capability

- Track Technology Developments
  - - Smart Munitions
  - - Warheads
  - - Fire From Enclosure
- User Requirement Additions & Changes

M72 Light Antiarmor Weapon (LAW)

- Disposable Launcher
- Carry Length: 775 mm (31 in)
- Unit Weight: 3.6 kg (7.9 lb)
- Warhead Diameter: 66mm
- Shaped Charge + EFP Warheads
- Navy IM Explosive (M72A7)
- U. S. Army Type Classified 1993
- Currently In Production
- Available Immediately
- Fielded With USSOCOM (SEALs)
- Fielded in 10 Countries Worldwide

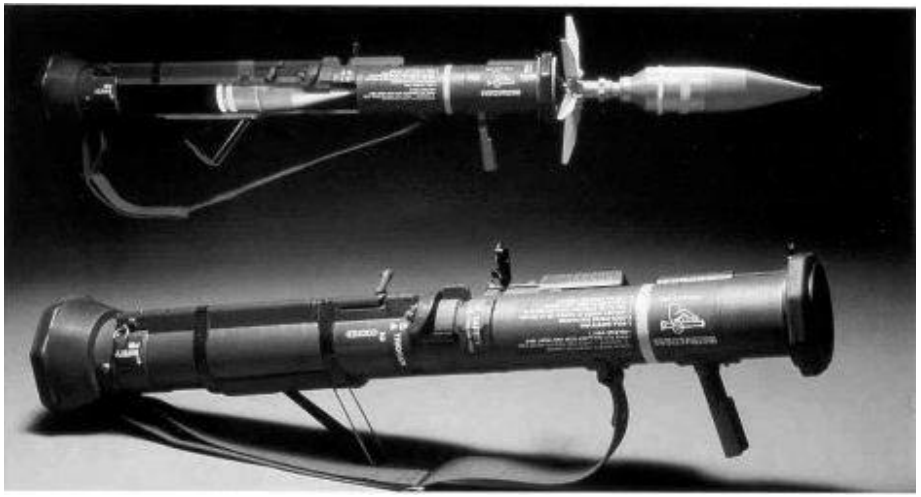


Improved M72 LAW Family

Talley
Defense Systems

M136 AT4 (HEAT Round)

- Type Classified and Fielded
- Used by Army & USSOCOM
- Disposable System
- Warhead Diameter: 84mm
- Length: 39.3 in
- Unit Weight: 15 lbs
- Range: 30-300m
- Night Vision Capable
- Defeat Mechanism: Shaped Charge Warhead With Bi-Metallic Liner
- Currently In Production in Sweden



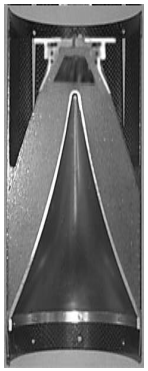
Saab Bofors Dynamics AB, Karlskoga, Sweden

Shown With AT4 Night Sight Bracket Attached

AT4

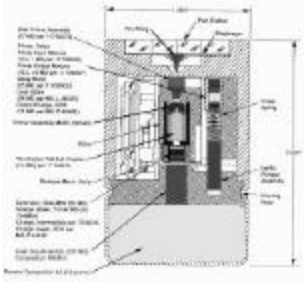
Shoulder-Fired Weapons
Growth Potential

Warheads



Propulsion

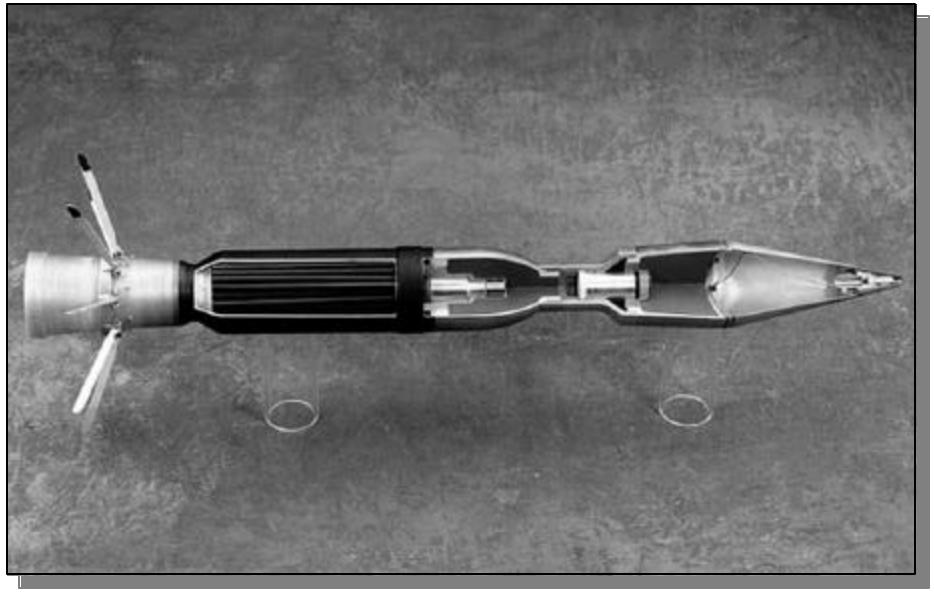
Fuzes



Follow Through Grenade (FTG)

Utilizes a Forward Shaped Charge to Create a Hole for a Follow Through Grenade Providing Incapacitating Fragments to Defeat the Target

- ***FTG Technology***
  - Fuzed Follow Through Grenade
  - Provides Incapacitation Behind Walls
- ***Application to SF Weapons***
  - Diehl Bunkerfaust System
  - IMI Warhead on SMAW-D
  - Both Tested by TECOM
  - Defeated Wall Targets (Triple Brick and 8” Reinforced Concrete) at 0 and 45 Degrees
  - Achieved High Degree of Behind Target Effects (P(i) > Requirement)



SMAW-D with Follow Through Grenade

ISRAEL MILITARY INDUSTRIES LTD. (IMI)

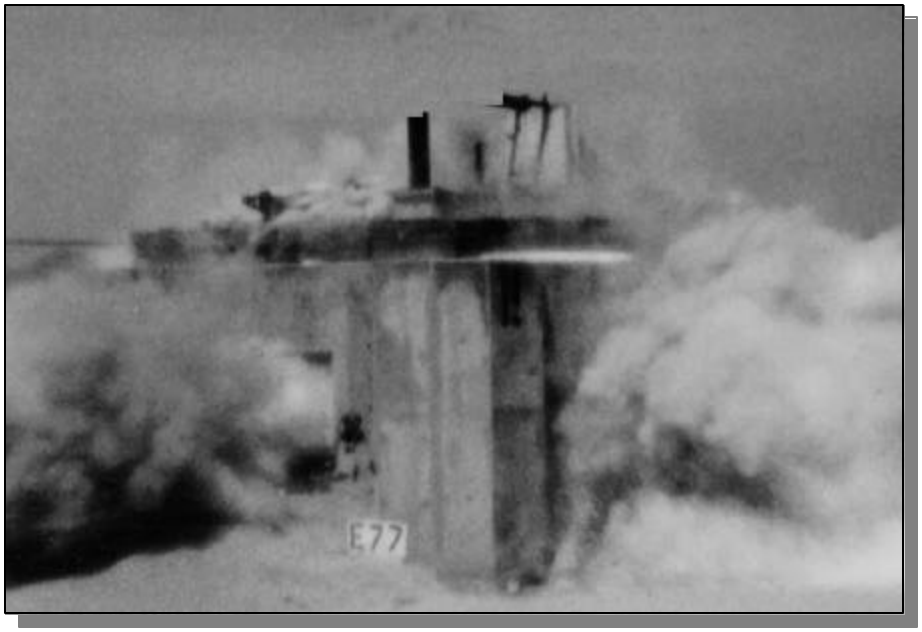
Talley Defense Systems

penetration-f.mpg

High Impulse Thermobaric

Replaces Conventional Aluminized Explosive with a High Impulse Thermobaric Explosive

- ***Thermobaric Technology***
  - Achieves Higher Pressure, Temperature and Duration Levels
  - Material is Normally a Slurry of Reactive Metal and Liquid Fuels
  - Optimized for Enclosed Spaces
- ***Application to SF Weapons***
  - SMAW-D with HIT Warhead
  - Testing at RTTC - Jul 01
  - Determine Feasibility of Loading HIT SMAW-D Warhead
  - Determine Hit Blast Effects on Triple Brick and Concrete Walls
  - Establish Feasibility of Thermobaric Warheads for MOUT Environments for SF Systems



SMAW-D With HIT Blast Warhead

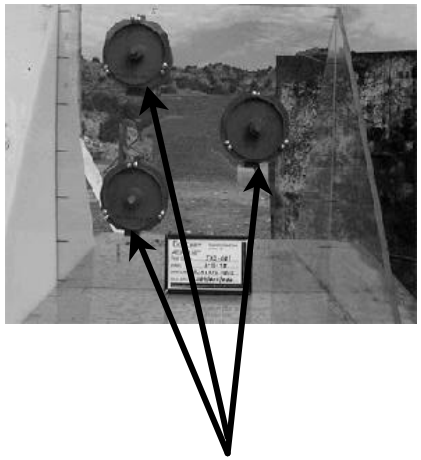
Talley Defense Systems

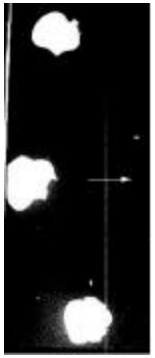
THERMOBARRIC

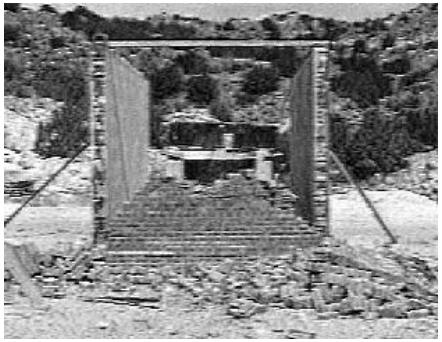
EFP Warheads

Brick and Reinforced Concrete Wall Breaching Warhead

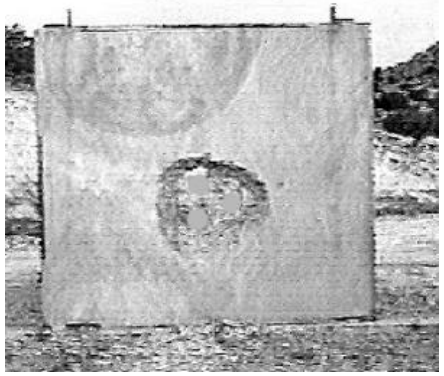
X-Ray of EFPs





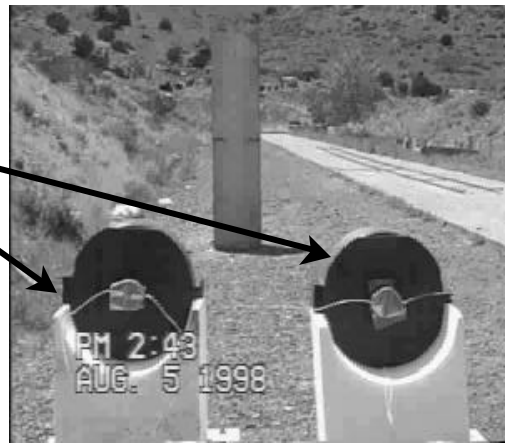


12-inch Brick Wall



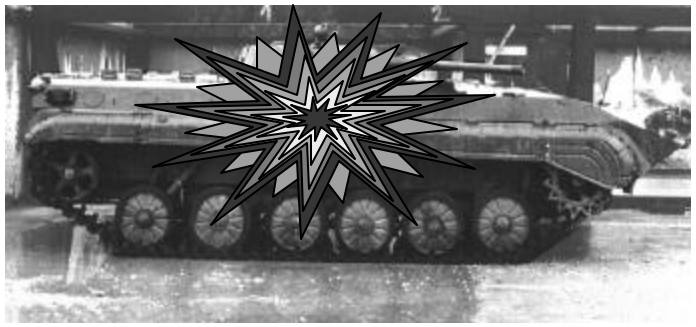
8” Reinforced Concrete Wall

Warheads



24” X 24” Heavily Reinforced Concrete Column - 65% of Concrete Removed

Shaped Charge Blast Warheads

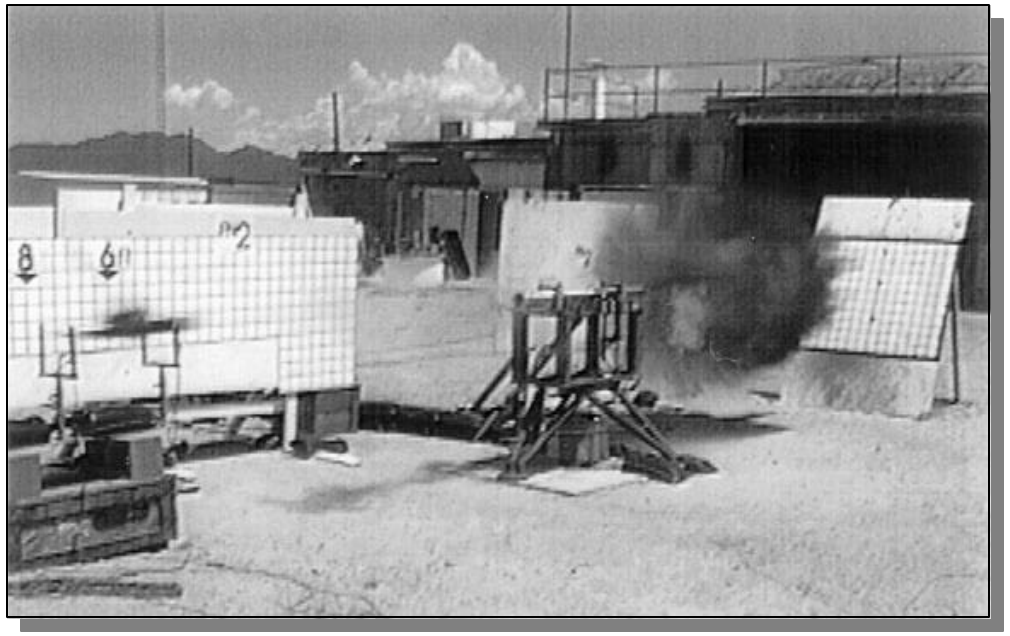


- One Multipurpose Warhead for Bunker and Armor Target Defeat
- Aluminized IM Explosive Replaces Conventional Explosive
- Demonstrated Bunker Defeat
- Dynamic Armor Testing - 4QFY01

Confined Space Propulsion Technology

Provides a Fire from Enclosure Capability to Fielded Shoulder-Fired Weapons while Maintaining their Lethality Against their Target Set

- ***Confined Space Technology***
  - Davis Gun Counter-Mass Principle
  - Maintain Velocity
  - Low Visual Signature
  - Safely Fire From Enclosure
  - Multiple Firings Allowable f/Training
  - Reduced Backblast Danger Zone
- ***Technology Application***
  - BDM (SMAW-D/CS)
  - AT4 (AT4 CS)
  - M72 LAW (CS)
  - MAAWS (CS)



USMC SMAW-CS Propulsion Subsystem

Talley Defense Systems

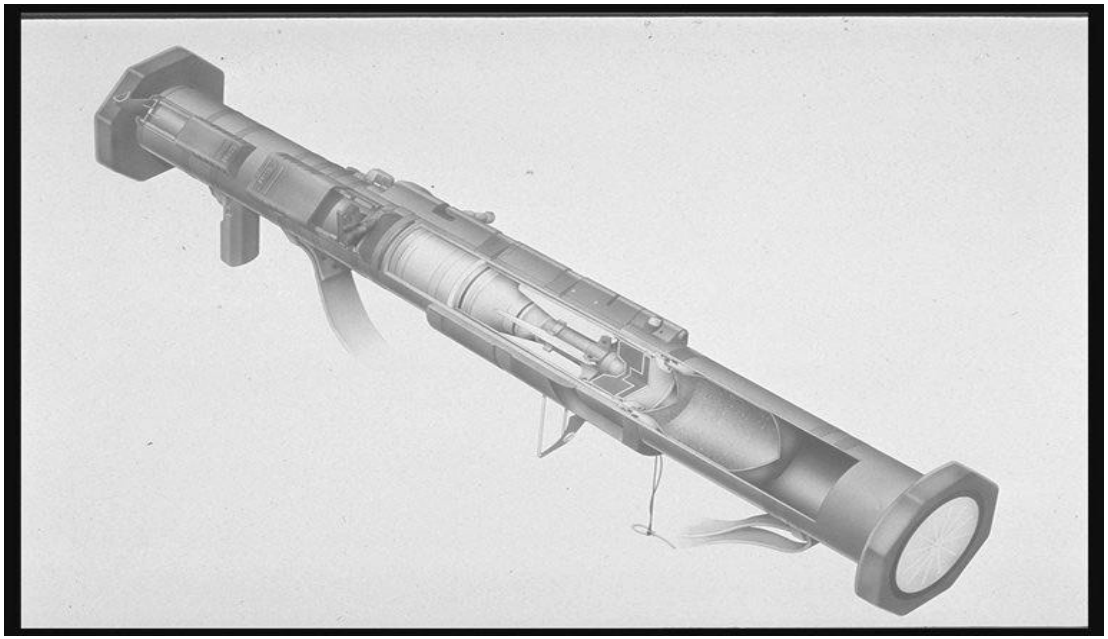
SMAW-D/CS Demonstration Program

SMAW-CS Propulsion Subsystem

- Leverage Completed USMC SMAW CS Demonstration Validation Program
- Successful Ballistic Testing Completed
- Significant Noise and Backblast Danger Zone Reduction
- Army Phase I (Concept Feasibility) Program Initiated - Apr 01
- Phase II (System Development & Demonstration) Planned & Funded - Aug 01
- Phase III (Qualification Testing) Planned FY02/03

Talley Defense Systems

AT4 Confined Space (AT4CS)



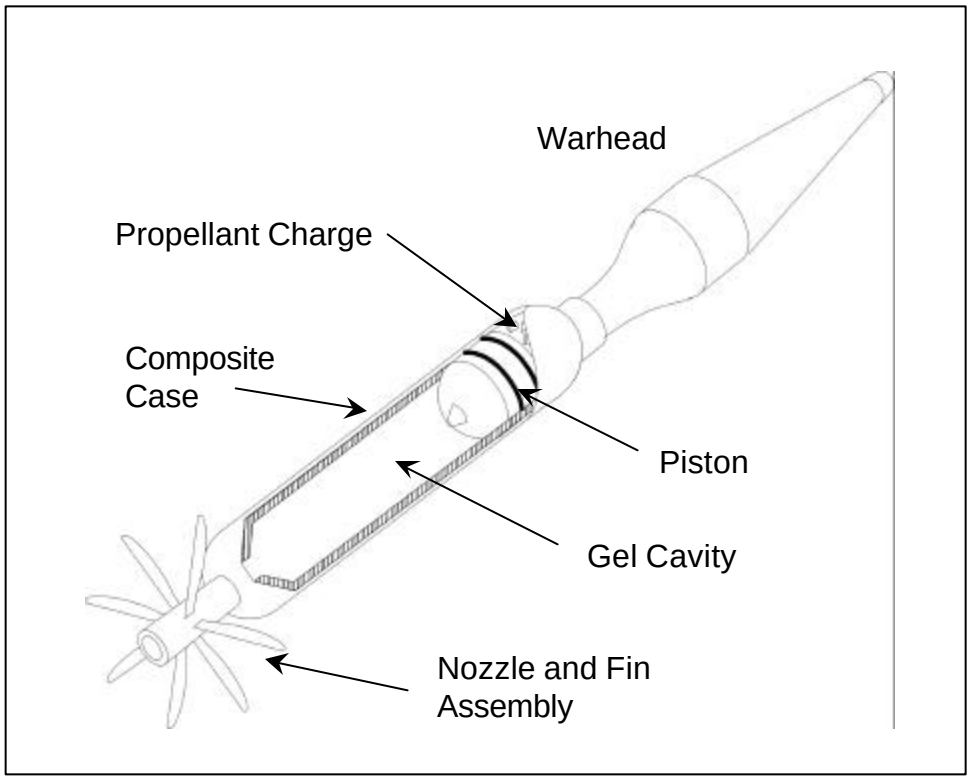
Saab Bofors Dynamics AB, Karlskoga, Sweden

- Weight: 16.5 lbs
- Length: 41 inches
- Range: 30-300m
- In Production in Sweden
- Fielded in France/Denmark
- USSOCOM FCT Program
- Addresses Highest Priority Target (Armor)
- Provides Near Term Solution to Confined Space Firings
- Utilize Existing AT4 Launcher & Warhead
- Leverages Existing AT4 Training and Support Systems
- Demonstrated Noise Reduction (U.S. Army CHPPM)
- Urgent Fielding to USASOC in FY01

SHOULDER 2

Confined Space M72 LAW

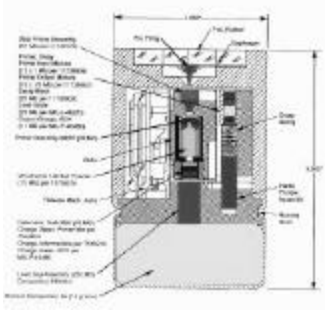
- Utilizes High Density Gelled CM
- 'Rocket' Concept Demonstrated in 1994 MPIM Tech Base Program
- Fully Contains Flash and Smoke
- Very Low Firing Noise Levels
- Duplicates Tactical Round Velocity 200 m/s (650 f/s)
- Existing Warheads, Fuze, and Launcher Used Without Change
- No Visible Firing Signature
- Total System Weight < 11 lbs
- Firing Noise < 150 dB
- Flight Weight Demonstration Tests: Aug 01



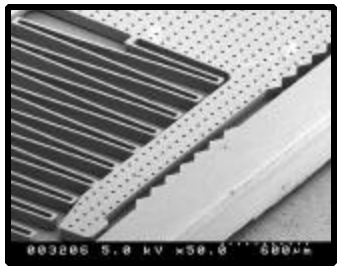
Talley Defense Systems

Advanced Fuzing Technologies

- Improved Versions of Baseline Fuzes
  - Mk 420 Mod 0 (SMAW-D)
  - HEAT, HE, SMOKE, ILLUM (MAAWS)
  - AT4 CS



- Incorporate Next Generation Technology
  - MEMS (Across All SFW Platforms)
  - Improves Safety, Reliability and Long-Term Stability



Conclusion

- Lighter
  - Proliferable
    - Versatile
      - Lethal
        - Affordable

Through the Application of Advanced Technologies Tomorrow's Shoulder-Fired Weapons will Continue to Play an Integral Role as the Army Transforms Through the Interim to the Objective Force